

#### ABSTRACT OF THE DISCLOSURE

A crystal analyzing apparatus is provided which is capable of performing three-dimensional crystal analysis. With an electron beam (~~B2~~) scanning a measured surface (~~S1~~), a detecting unit (~~6~~) detects an electron backscatter diffraction pattern from each pixel in the measured surface (~~S1~~) and a data processing block (~~9~~) analyzes the data (~~D1~~) to obtain two-dimensional distribution data (~~K1~~) about the crystal orientation of the measured surface (~~S1~~). Next, an ion beam (~~B1~~) is emitted to slice the sample (~~H1~~), so as to form the next measured section (~~S2~~) at a position inward from the measured surface (~~S1~~) by a given distance (~~L~~). Two-dimensional distribution data (~~K2~~) about the crystal orientation of the measured surface (~~S2~~) is then obtained. These operation steps are repeated to sequentially obtain crystal-orientation two-dimensional distribution data (~~K3~~) to (~~Kn~~) about measured surfaces (~~S3~~) to (~~Sn~~). Next, the data processing block (~~9~~) stacks the two-dimensional distribution data (~~K1~~) to (~~Kn~~) in this order to construct crystal-orientation three-dimensional distribution data (~~Q~~).